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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/932,085	08/17/2001	James Joseph Anthony McCormack	NL 000460	5456

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EXAMINER

NGUYEN, JIMMY H

ART UNIT	PAPER NUMBER
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2673

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DATE MAILED: 03/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/932,085

Applicant(s)MCCORMACK, JAMES JOSEPH
ANTHONY**Examiner**

Jimmy H. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 August 2003.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-9 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 29 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action is made in response to applicant's amendment filed on 08/29/2003 (entered into the file wrapper as Paper No. 5). Claims 1-9 are currently pending in the application. An action follows below:

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the feature, "a voltage having a **periodically changing polarity**" recited in claim 1, line 2, claim 5, lines 3-4, claim 6, lines 1-2, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claim 7 is objected to under 37 CFR 1.75(a) because although this claim meets the requirement 112/2d, i.e., the metes and bounds are determinable, however, the feature, "a common node" (see line 2) should be changed to --said common node--, because of the sufficient antecedent basis for this limitation in independent claim 6 (see line 12).

It is in the best interest of the patent community that applicant, in his/her normal review and/or rewriting of the claim, take into consideration these editorial situations and make changes as necessary.

Claim Rejections - 35 USC § 103

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4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weber et al. (USPN: 4,866,349), hereinafter Weber, and further in view of Lo (USPN: 6,483,490 B1).

As per claims 1 and 5, Weber discloses a matrix display apparatus (fig. 2) comprising a matrix of pixels (fig. 2) associated with intersecting electrodes (sustain electrodes and address electrodes, fig. 2), and an energy recovery matrix display driver (fig. 5) for generating a voltage (V_p) having a periodically changing polarity across a capacitive load (C_p) (fig. 6), the driver comprising an inductor (L) being coupled to the capacitive load (C_p), a first switch ($S1$), a second switch ($S3$), a power supply voltage (V_{cc}) and an inherent control circuit for controlling the switches to periodically open and close (fig. 6). Accordingly, the difference between the invention defined in these claims and the Weber reference is the addition of a switch circuit connected in parallel with the inductor.

However, the Lo reference discloses a related display apparatus comprising an energy recovery matrix display driver circuit (an energy recovery circuit 702/704, fig. 7, col. 5, lines 37-38) including a switch circuit (a bi-directional switch 706/708, fig. 7, col. 5, line 41) connected in parallel with the inductor ($L1/L2$) for circulating a current ($I11/I12$) through the inductor ($L1/L2$) in a loop formed by a switch circuit (706/708) and the inductor ($L1/L2$) (see figs. 7 and 8, col. 6, line 25 through col. 7, line 39). Specifically fig. 8, and the description, col. 6, lines 51-55, col. 6, lines 25-65, Lo teaches the loop formed by a switch circuit (706) and the inductor ($L1$)

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being closed at time t_1 , at which the current changes polarity at the end of the resonance period (further see col. 6, lines 25-65). It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to provide Lo's the switch circuit in the Weber system because this would improve the luminous efficiency of the display device, especially for a large display device, as taught by Lo (col. 2, lines 14-20).

Regarding to claims 2 and 3, Lo further teaches the switch circuit (706/708) comprising a series arrangement of a diode (D9/D11) and a controlled switch (M9/M11), and a series arrangement of a diode (D10/D12) and a controlled switch (M10/M12) (figs. 7 and 8).

Regarding to claim 4, Lo further teaches that the inherent control circuit, for controlling all the switches, is adapted to close the second switch (M1/M5) after the instant at which the loop is closed (figs. 7 and 8, col. 6, line 25 through col. 7, line 39).

6. Claims 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moon (USPN: 6,111,556), and further in view of Lo.

As per claims 6 and 7, the claimed invention reads on the Moon reference as follows: Moon discloses a well-known energy recovery matrix display driver circuit (fig. 1) for generating a voltage (VL) having a periodically changing polarity across a capacitive load (CL), the driver comprising an inductor (L0) being coupled to the capacitive load (CL), a first switch (Q1), a first current path (D3, Q3) including a diode (D3) and a second switch (Q3), for passing a current from a power supply voltage (Vo), a second current path (D4, Q4) including a diode (D4) and an additional switch (Q4), for passing selectively passing current from the capacitor load (CL) to a common node (an output terminal OUT) shared by the inductor (L0), the capacitive load (CL), the first current path (D3, Q3) and the second current path (D4, Q4), and an inherent

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control circuit for controlling the switches (Q1-Q4) to periodically open and close. Accordingly, the difference between the invention defined in these claims and the well known circuit as taught by Moon, is the addition of a switch circuit connected in parallel with the inductor.

However, the Lo reference discloses a related display apparatus comprising an energy recovery matrix display driver circuit (an energy recovery circuit 702/704, fig. 7, col. 5, lines 37-38) including a switch circuit (a bi-directional switch 706/708, fig. 7, col. 5, line 41) connected in parallel with the inductor (L1/L2) for circulating a current (I11/I12) through the inductor (L1/L2) in a loop formed by a switch circuit (706/708) and the inductor (L1/L2) (see figs. 7 and 8, col. 6, line 25 through col. 7, line 39). Specifically fig. 8, and the description, col. 6, lines 25-65, Lo teaches the loop formed by a switch circuit (706) and the inductor (L1) being closed at which the current changes polarity at the end of the resonance period. It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to provide Lo's the switch circuit in the well-known circuit, as taught by Moon, because this would improve the luminous efficiency of the display device, especially for a large display device, as taught by Lo (col. 2, lines 14-20).

Regarding to claims 8 and 9, as discussed above, since the combination of Moon and Lo references includes all the limitations as claimed, this implies that the Moon control circuit in view of Lo is adapted for controlling the switch circuit in order to limit electro-magnetic interference and the circulating current.

Response to Arguments

7. Applicant's arguments with respect to the specification objection, claim 5 objection, and the drawing objection as failing to designate a legend, "Prior Art", have been fully considered

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and are persuasive in view of the amendment filed on 08/29/2003. These objections have been hereby withdrawn.

8. Applicant's argument with respect to the drawing objection under 37 CFR 1.83(a), page 9 of the amendment, is not persuasive, because Fig. 3 simply shows all the elements of the circuit, and does not show the waveform of the voltage having a **periodically changing polarity**, as recited in claims 1, 5 and 6. This drawing objection is therefore maintained.

9. Applicant's arguments, see pages 9-11 of the amendment, filed on 08/29/2003, with respect to the rejections under 35 USC 103(a) to claims 1-5, have been fully considered but they are not persuasive because as follows:

Applicant argues that the combined teachings of the prior art fail to teach "loop being closed not later than an instant at which said current changes polarity at the end of the resonance period", see page 10, lines 4-7... Examiner disagrees because the Lo reference implicitly discloses the loop formed by a switch circuit (706) and the inductor (L1) being closed at time t1', at which the current changes polarity at the end of the resonance period (further see col. 6, lines 25-65).

Applicant argues that the 490 switch circuit is coupled to the inductor by a capacitor (C2) which would inherently block current from looping around the inductor (L2) of the 490 switch circuit, page 10, lines 14-18. Examiner disagrees because the Lo reference, specifically col. 6, lines 51-55, and col. 7, lines 32-39, implicitly discloses the current (I11/I12) of the inductor (L1/L2), flowing to the capacitor (C1/C2) through the switch (M9/M11) and the diode (D9/D11). In other words, the Lo capacitor (C1/C2) wouldn't block the current from looping around the inductor (L1/L2), as argued by Applicant.

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For the above reasons, it is believed that the rejection should be sustained.

10. Applicant's argument with respect to new claims 6-9, page 11, has been considered but are moot in view of the new ground(s) of rejection.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jimmy H. Nguyen whose telephone number is (703) 306-5422. The examiner can normally be reached on Monday - Thursday, 8:00 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached at (703) 305-4938.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

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Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive,
Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding
should be directed to the Technology Center 2600 Customer Service Office whose telephone
number is (703) 306-0377.

JHN
March 29, 2004



BIPIN SHALWALA
SUPERVISORY PATENT EXAMINER
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